DOCUMENT RESUME

ED 452 413 CE 081 700

AUTHOR Lai, Su-Huei
TITLE Conceptual Framework of Modes of Problem Solving Action (MPSA): Implications for Internet Teaching and Learning.
PUB DATE 2000-09-00
NOTE 8p.; Paper presented at the Annual International Meeting of the Chinese American Educational Research and Development Association (8th, Jamaica, New York, September 16-17, 2000).
PUB TYPE Opinion Papers (120) -- Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE EDRS Price MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS Computer Uses in Education; Critical Thinking; Decision Making; *Distance Education; Educational Practices; Educational Research; Educational Theories; Interaction Process Analysis; Internet; Logical Thinking; *Models; Postsecondary Education; Problem Based Learning; *Problem Solving; Strategic Planning; Teacher Role; *Teacher Student Relationship; Technical Education; *Theory Practice Relationship; Thinking Skills
IDENTIFIERS Knowledge Acquisition

ABSTRACT

The conceptual framework of the Modes of Problem Solving Action (MPSA) model integrates Dewey's pragmatism, critical science theory, and theory regarding the three modes of inquiry. The MPSA model is formulated in the shape of a matrix. Horizontally, there are the following modes: technical, interpretive, and emancipating. Vertically, there are following stages of problem solving: (1) clarify a problem; (2) analyze a problem; (3) generate possible solutions; (4) analyze consequences; (5) select the best solution; and (6) make an action plan. Technical problem solving refers to strategic action using empirical inquiry and manipulated ways of knowing or doing for the purpose of control. Interpretive problem solving refers to achieving understanding. Emancipating action refers to seeking reasonable, morally defensible, and consensus value ends and taking social action to ensure those ends. The increasing interest in distance learning has necessitated greater understanding of the variables related to the nature of teachers and students and the interactive effects of those variables on Internet teaching and learning. The conceptual framework of the MPSA model can provide alternative views of the paradigm shift for Internet teaching and learning and help articulate theory and practice when planning, implementing, and evaluating distance learning via the Internet. (Contains 20 references.) (MN)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 452 413

Lai, S.H. (2000). Conceptual framework of modes of problem solving action (MPSA): Implications for Internet teaching and learning. The Eighth Annual International Conference Proceedings of Chinese American Educational Research and Development Association (pp.165-170). September, 16-17, 2000, Jamaica, New York.

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

X This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

S.H. Lai

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

2B

CE 081 705

BEST COPY AVAILABLE

Conceptual Framework of Modes of Problem Solving Action (MPSA): Implications for Internet Teaching and Learning

Su-Huei Lai, Ph.D.
FEMsys Consulting, Inc. http://www.FEMsys.com

Introduction

The conceptual framework of Modes of Problem Solving Action (MPSA) (Lai, 1995) was formulated by examining and integrating Dewey's pragmatism (Dewey, 1910, 1916; Gutec, 1988), critical science theory (Habermas, 1992), and three modes of inquiry (Brown, 1979; Brown and Paolucci, 1979; Brown, 1985; 1986; Young, 1990; Habermas, 1992; Giarelli, 1992). Lai indicated that the three modes of inquiry reflect three types of research or knowledge acquisition methods which are also reflected in at least six problem solving stages: clarifying a problem, analyzing a problem, generating possible solutions, analyzing consequences, selecting the best solution, and making an action plan. Thus, the three modes of inquiry embedded in the practical problem reasoning model (the six problem solving stages) become a seamless MPSA matrix (Table 1) to examine problem solving methodological actions. Therefore, the conceptual framework of MPSA refers to the three types of thinking disposition: technical, interpretive, and emancipating problem solving modes. The technical problem solver processes personal thinking and action based on objective views and pre-defined rules. The interpretive problem solver focuses on social dialectic context. The emancipating problem solver examines the reality, critiques the pre-defined rules, and solves problems through reconstruction of social practice. The intent of this paper is to further elaborate MPSA and its implications for Internet teaching and learning.

Conceptual Framework for Modes of Problem Solving Action (MPSA)

Modes / **Stages**	Technical	Interpretive	Emancipating
Clarify a problem			
Analyze a problem			
Generate possible solutions			
Analyze consequences			
Select the best solution			
Make an action plan			

As illustrated in the above table, the conceptual framework of Modes of Problem Solving Action (MPSA) is formulated in a matrix shape. Horizontally, there are technical, interpretive, and emancipating modes. Vertically, there are six stages: (1)

Clarify a problem. (2) Analyze a problem, (3) Generate possible solutions, (4) Analyze consequences, (5) Select the best solution, and (6) Make an action plan. Each mode of thinking disposition reflects different action in each stage.

Technical problem solving action refers to the strategic action which uses empirical inquiry and manipulated ways of knowing or doing for the purpose of control (Brown, 1986; Thomas, 1986; Way, 1989). A technical problem solver can apply technical action in the phase of practical reasoning. For example, technical problem solvers follow theories to explain a problem or apply experts' rules to clarify a problem. They analyze the problematic factors of the problem by using evidence drawn from previous research findings or experts' models. When they selected possible solutions, they apply pre-built and fixed structure, or universal formulas. If it is necessary to analyze the consequences, technical problem solvers trace the loop of the structure and use pre-assumptions to estimate cause-effects or generalized results from pre-research findings to predict possible outcome. If it is necessary to select the best solution, technical problem solvers may test their methods by examining whether the selected method is efficient and manageable. To select a best solution, technical problem solvers may go back to the theorists, authorities, or experts to make sure those objective methods they used followed or fit the rules or structure. Bureaucratic administrators, traditional types of teachers, police, mathematicians, or engineers may often apply such methods to solve their problems in their working place in planning the action, technical problem solvers follow those pre-defined rules and those pre-determined structures that they used to design their step by step procedures. The salient features of technical action are quick, organized, pre-planned, and efficient. However, the weaknesses are that technical action is oversimplified and its optimistic procedures might screen out something important or include something misunderstood. Strategies, methods, and values from a technical perspective are quite different from those with interpretive perspective (Lai, 1995; Lai,& Laster, 1996; Lai 2000).

Interpretive problem solving action refers to "the rationally motivating force of achieving understanding" (Habermas, 1992. P. 90). The focus is on the meaning of symbols used in communication, of values, of concepts, of reasons, of intentions in practice or action. The purpose of interpretive action is to identify common principles for solving the problem. Interpretive problem solvers define a problem based on interpretation of people involved through communicating with them. They clarify problems by using common problematic symbols, actions, and interpretations by communicating with those involved. They present inter-subjective views of people in the problematic situation to analyze the problem. In a similar way, they explore possible solutions by the use of democratic communication. To analyze the consequences for possible solutions, the interpretive problem solvers focus on both diverse meanings and shared common experiences from the people involved through communicating with them. Since the problem solvers and people involved in the problematic situation are mutually respected, the best choice in light of inter-subjective views is toward normative needs through understanding the common interpretation of a group of people. In addition, because the focus is on the democratic and shared experiences through dialectic

communication, the approach and action plan remain open-ended (Lai, 1995; Lai & Laster,1996; Lai, 2000).

Emancipating action refers to the critique format which traces behavioral norms back to underlying ideology through dialectical interaction in a real world situation (Brown, 1985; Coomer & Hultgren, 1989; Giarelli, 1992; Thomas, 1989). The purpose of emancipating action is to seek reasonable, morally defensible, and consensus value ends and takes social action to ensure these value ends. The emancipating problem solvers critique the reality between technical and interpretive information. They examine the validity claim in both situations. While analyzing a problem, reflective problem solvers analyze conflicts between the theoretical predication and true meanings of people involved in the problematic situation by using in-depth language. In so doing, to seek possible solutions, they focus on reasoning of social economics, and political concerns with people's linguistic expression and their gestures. They also use reasoning to analyze consequences for possible solutions so that the best choice is an intellectual and morally defensible solution. Such complexity requires problem solvers' critical thinking and psychoanalytical capability to understand personality in the self and others in dialectic conversation. Moreover, through dialogue and disclose self awareness, the value end will be sought in a collegial situation and draw a conceptual framework for the action based on the true meaning of those people involves in the problematic situation (Lai, 1995; Lai & Laster, 1996; Lai, 2000).

Implications for Internet Teaching and Learning

With increasing interest in distance learning, there needs to be a parallel discovering of research examining the variables related to the nature of teachers, the nature of students, and their interactive effects on Internet teaching and learning. One of the important factors for the nature of students and teachers is their teaching styles or learning styles. Recently, educators take learning styles as one of important factors in discussing Internet teaching and learning. For example, Rogers (2000) described five types of adopters in relation to the technology adoption. These five types included "the innovators", "the early adopters", "the early majority", "the late majority", and "the laggards" (p. 21). Nevertheless, the illustration of the categories focused more on the proportion of adoptive types rather than the underlined thinking disposition. Another popular categorization dichotomizes learning styles into field dependent or field independent learners. The conceptual framework of MPSA, which combines three modes of inquiry and six stages of practical reasoning, may serve as one of alternative assessments for understanding the nature of teachers and students and their interactions on the effectiveness of Internet teaching and learning during the planning, implementing, and evaluating sessions

In the planning session for developing effective Web-based lessons, identifying the nature of students in terms of MPSA is one of the principles (Lai, 2000). For example, technical students may favor a well-organized course. Thus, discussing with other students or instructors is not their best interest. On the contrary, the interpretive

learners may need more elaboration and rapport along with their leaning journey in the Web courses. Thus, assessing students' MPSA to understand their needs may be one of considerable factors for developing effective Web-base lessons.

Next, the effects of interaction between teachers and learners may be another factor to be examined while implementing Internet teaching and learning. For example, if the role of the teacher is a technical problem solver, the degree of the reflective attitudes may differ from the interpretive or emancipating mode of problem solvers. It is valuable to know whether there are significant effects on learning due to the interaction between different or similar MPSA.

Finally, since the role of the teacher is also an assessor throughout the planning, implementing, and evaluating stages of Internet teaching and learning, different types of thinking disposition may result in different ways of doing. For example, a technical problem solver may believe that the students' achievement can be assessed by a form-filled test, which was pre-designed on the home page. If the technique of a form-filled test does not well designed, one may raise the questions regarding reliability or validity of the test. The interpretive problem solver assessing learners focuses on the reflective meaning from any facilities such as a paper from URL, discussions on an ICQ-like mode, or interpretations on a message board. The emancipating mode of problem solver discloses self and allows alternatives to examine the technical information and interpretive information in order to search for the true validity of assessment on students' learning. The enterprise of emancipating action involves more about social context and requires critical thinking when compared to the others.

Suggestions

The conceptual framework of Modes of Problem Solving Action (MPSA) provides alternative views of a paradigm shift for Internet teaching and learning. With the rapidly changing technology, the constant for today may become a variable for tomorrow. Thus, articulation of the theory and practice in Internet teaching and learning via MPSA should be important for educators. The interested researcher may further explore the above issues mentioned in the previous paragraphs.

References

Brown, M. M. (1979). A conceptual scheme and decision rules for the selection and organization of home economics curriculum content. Madison Wisconsin: Department of Public Instruction

Brown, M. M. & Paolucci, B. (1979). Home economics: A definition. Washington, DC: American Home Economics Association.

Brown, M. M. (1985). Philosophical studies of home economics in the United States: Our practical-intellectual heritage: East Lansing, Michigan: College of Human Ecology, Michigan State University.

Brown, M. M. (1986). Home economics: A practical or technical science? In J. F. Laster, & R. E. Dohner (Eds.). Vocational home economics curriculum: State of the field (pp. 39-55). Peoria, Illinois: American Home Economics Association.

Coomer, D. L. & Hultgren, F. H. (1989). Considering alternatives: An invitation to dialogue and question. In F. H. Hultgren, & D. L. Coomer,(Eds.). Alternative modes of inquiry in home economics research. Menomonie, Wisconsin: American Home Economics Association.

Dewey, J. (c1910). How we think. Washington, D. C.: Heath and Company.

Dewey, J. (c1916). Democracy & education. New York: The Macmillian Company.

Gentzler, Y. S. (1987). A conceptualization of competence: Constructs for professional development. Journal of Home Economics, 79, 39-42.

Giarelli, J. M. (1992). Critical theory and educational research. Qualitative Studies in Education, 3(1), 3-5.

Gutek, G. L. (1988). Philosophical and ideological perspectives on education. New Jersey: Prentice Hall Inc.

Hultgren, F. (1989). Using interpretive-critical inquiry perspective to study critical thinking in home economics. Journal of Vocational Home Economics Education. 7(1). 10-35

Habermas, J. (1992). Postmetaphysical thinking: Philosophical essays. (W. M. Hohengarten, Trans.). Massachusetts: The MIT Press.

Lai. S. H. (1995). The development of a modes of problem solving instrument for family and consumer sciences education (Doctoral dissertation. The Ohio State University, 1995). Dissertation Abstracts International (No AAT9612219, 1996).

Lai, S. H. & Laster, J. F. (1996). The development of a modes of problem solving action inventory for Family and Consumer Sciences Education. Paper presented at the XVIII World Congress of International Federation for Home Economics, July 21-26, 1996, Bangkok, Thailand.

Lai, S.H. (2000). Conceptual framework of modes of problem solving action (MPSA): Implications for teacher education. Paper presented at the meeting of Ohio Chinese American Professional Association Symposium 2000. May 27-28, 2000, Athens, Ohio.

Lai, S.H. (2000). Principles and suggestions for developing effective Web-based lessons. The Eighth Annual International Conference Proceedings of Chinese American Educational Research and Development Association (pp. 21-25),. September 16-17, 2000, Jamaica, New York.

Laster, J. F. (1987). Instructional strategies for teaching practical reasoning in consumer homemaking classrooms. In G. Thomas (Ed.). Higher order thinking: Definition meaning and instructional approaches (pp. 44-61). Washington D. C.: Home Economics Education Association.

Thomas, R. (1986). Alternative views of home economics; Implications for K-12 home economics curriculum. Journal of Vocational Home Economics Education, 4(2). 162-191.

Way, W. L. (1989). Examining critical thinking in home economics education: An empirical/analytical perspective. Journal of Vocational Home Economics Education, 7(1). 1-9.

Young, R.E. (1990). Habermas'ontology of learining: Reconstructing of Dewey. Educational Theory, 40(4). 471-482.